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THE MOUNTAIN PINE BEETLE INFESTATIONS IN THE LODGEPOLE AND WHITEBARK PINE STANDS OF THE YELLOWSTONE NATIONAL PARK 1934

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1934

As part of the plan to determine the extent of the 1934 infestation throughout the timbered regions of what has been called the Yellowstone Park Project, an insect survey was conducted in Yellowstone Park under a cooperative agreement between the National Park Service and the Bureau of Entomology and Plant Quarantine. The Park Service secured the appropriation and administered the project while the Bureau of Entomology directed the survey through an official of the Coeur d'Alene Laboratory, who was in direct charge of operations.

The survey, which covered a large portion of the park, revealed an epidemic stage of infestation in all of the whitebark stands and an endemic stage in the lodgepole stands except in the Bechler River area and in the Gallatin Valley.

The following tables show the extent of infestation as found in 1934 and the results of former surveys of portions of the seven units into which the park has been divided. (See attached map.)

STATUS OF THE MOUNTAIN PINE BEETLE INFESTATION 1931 to 1934

Unit Area	1931* Acres	1931* Inf. trees	1932* Acres	1932* Inf. trees	1933* Acres	1933* Inf. trees	1934 Acres	1934 Inf. trees
NW Corner	40,552	30,233	40,552	26,743	67,892	31,496	349,000	69,367
Washburn	5,120	2,412	5,120	2,493	5,120	2,847	175,000	8,859
NE Corner					12,818	4,036	489,000	27,900
Central							200,000	1,800
Madison							200,000	6,000
Bechler	37,760	2,794	37,760	3,964	57,167	9,279	226,000	84,690
SE Corner	34,394	7,645	34,394	7,397	59,116	13,347	314,000	53,745
Total	117,826	43,084	117,826	40,597	202,113	61,005	1,953,000	252,361
Inf. trees per acre		.36		.34		.30		.129

* Data secured from National Park Service surveys.

It is a difficult task to present the status of an infestation in tabular form because the actual data presented in that manner are sometimes misleading to one not familiar with the problem.

In the above table, the data showing the 1931, 1932 and 1933 infestation were obtained almost entirely from areas of infested whitebark pine with the exception of the Bechler River unit. The 1931 and 1932 data for the Bechler River presents infested lodgepole pine while to the 1933 data for the same unit has been added the acreage and infestation found in the whitebark pine on the pitchstone plateau.

It is difficult to draw conclusions from the above table because of the differences in acreage surveyed. The data for the year 1932 which were taken from the same acreage as in 1931, show a slight decrease and with the addition of some 90,000 acres covered, the 1933 data show a further decrease in infested trees per acre which may have been due to the surveying of additional areas of lighter infestations. However, data secured in 1933 on the same areas as those surveyed in 1932, show a decrease of 18.5 percent. The 1934 survey data, which have been applied to all the timbered acreage within the park, show a decrease of more than 50 percent infested trees per acre as compared to 1933. This decrease is due to the large amount of acreage covered, some of which carried little or no infestation. The 1933 survey, which was made in infested whitebark pine areas and in the lodgepole pine stands of Bechler, showed an infestation of .302 infested trees per acre, which is comparable to the infestation of .329 infested trees per acre found in whitebark pine in 1934. (Table II.) From these data, we are led to believe that there has been an epidemic stage of infestation in the whitebark pine stands for the past four years, with no very marked fluctuations in the status of the infestation.

Table II

The Mountain Pine Beetle Infestation in the Lodgepole and Whitebark Pine Stands of the Yellowstone National Park
1934

Unit area	Acres W. B. type	N. A. per acre	Total Inf. W.B.P.	Acres of L.P.P. type	N. A. per acre	Total inf. L.P.P.	Total Inf. on unit
NW Corner	84,000	.463	38,892	265,000	.115	30,475	69,367
Washburn	22,000	.201	4,422	153,000	.029	4,437	8,859
NE Corner	139,000	.165	23,000	350,000	.014	4,900	27,900
Central	Estimated, not surveyed			200,000	.009	1,800	1,800
Madison	"	"	"	200,000	.030	6,000	6,000
Bechler	26,000	.375	9,750	200,000	.374	74,940	84,690
SE Corner	103,000	.458	47,204	211,000	.031	6,541	53,745
Total	374,000	.329	123,268	1,579,000	.082	129,093	252,361

Because of the geographical difference between the infestation in the whitebark and lodgepole pine stands, they present two entirely different problems and must be dealt with separately. The infestation in the whitebark stands is rather heavy and is present wherever the mature stands of this species occur. The type is confined to high ridges and usually begins at altitudes of 8000 feet and extends up to timber line which varies from the 9000 to the 9500 feet. In some instances as high as eighty percent of the stands have been killed but the average infestation is slightly over 3 infested trees per acre throughout the type. However, this is a relatively high degree of

infestation because whitebark stands are not heavy and .3 infested trees per acre represent a relatively high percentage of kill. Lodgepole pine occurring in whitebark stands have been infested to some extent, especially when in the vicinity of infested whitebark pine. Under these circumstances, the attacks are as severe as those found in the infested whitebark pine and have been classed as whitebark infestation because in reality they are a part of that infestation.

The only epidemic infestations found in the pure lodgepole stands were in the Bechler River-Pitchstone Plateau area and to a lesser degree in the Gallatin Valley.

The conclusions that may be drawn from the results of the 1934 insects survey are: No serious epidemic exists in the lodgepole stands of the park except in the Bechler River-Pitchstone area and in the Gallatin Valley. All of the whitebark stands are heavily infested and a large percentage of the stand has already been destroyed. There seems to be but little hope for the remaining mature whitebark stand unless the infestation is soon checked by natural or artificial means. The probability of the infestation spreading from the whitebark areas into the lodgepole stands of the high central and eastern region is unknown, but as yet there is no evidence of such a spread.

The insect survey was started August 31 and ended October 4, and was conducted by three 4-man crews. Two of the crews moved by

pack string and employed a packer for each crew. The third crew moved by truck and worked all areas accessible by car. During the latter part of the survey, after all the remote areas that were accessible by pack string had been examined, another truck was secured and the job was finished from the roads.

The survey was delayed to some extent because men of the type required for the work were hard to secure. Five men were transported from the Coeur d'Alene region and the balance of the crew was secured from the park service. However, men with the necessary experience and training are difficult to find as they are usually employed at other tasks.

During the course of the 1934 survey, 7432 sample acres of strip were examined or 1/2 of 1 percent of the area surveyed. It was found advisable to work the men in pairs on a two chain strip. Although in working in this manner the sample strips were confined to too small an area and did not have the spread of one-man single-chain strips, it was resorted to after an unfortunate accident when a member of the crew, while working alone, was severely injured by the attack of a grizzly bear. It was also found necessary to work an entire crew together on a four chain strip while cruising in the deep snow on Mount Washburn. Considerable difficulty was experiences because of the heavy snowfall in the latter part of September and the survey was not as complete as it should have been because it was necessary to abandon the use of pack stock. Brief examinations only were made in the lodgepole stands

of the central plateau and data from comparable areas outside the park were used as the basis for the estimate of the Madison Plateau. The determination of acreages for the lodgepole and whitebark stands was also a difficult task. However, when it was found that the whitebark type almost invariably ranged between the 8000 and 9500 foot elevation, it was possible to secure the acreage for this type from a contour map. All other areas were considered lodgepole type except known large open or barren areas.

Many of the difficulties which lowered the efficiency of the 1934 survey may be avoided in the future. It is advised that a start with two complete, fully-trained crews be made not later than the 20th of August. After working all the outlying areas by pack string, the crews can be transported to the remaining areas by trucks. Plans should be made to finish the work by the 20th or 25th of September to avoid the inclement weather which can be expected any time after the 20th of Sept.

The cost of the survey, which required approximately 400 man-days, was as follows:

Labor	$1,896.45
Supplies.	185.76
Trucking & transportation . .	107.17
Travel expense.	53.67
Total cost	$2,243.05
Contributed expense:	
Saddle horses & pack stock	401.75
Total cost of survey	$2,644.80

Respectfully submitted,

T. T. Terrell

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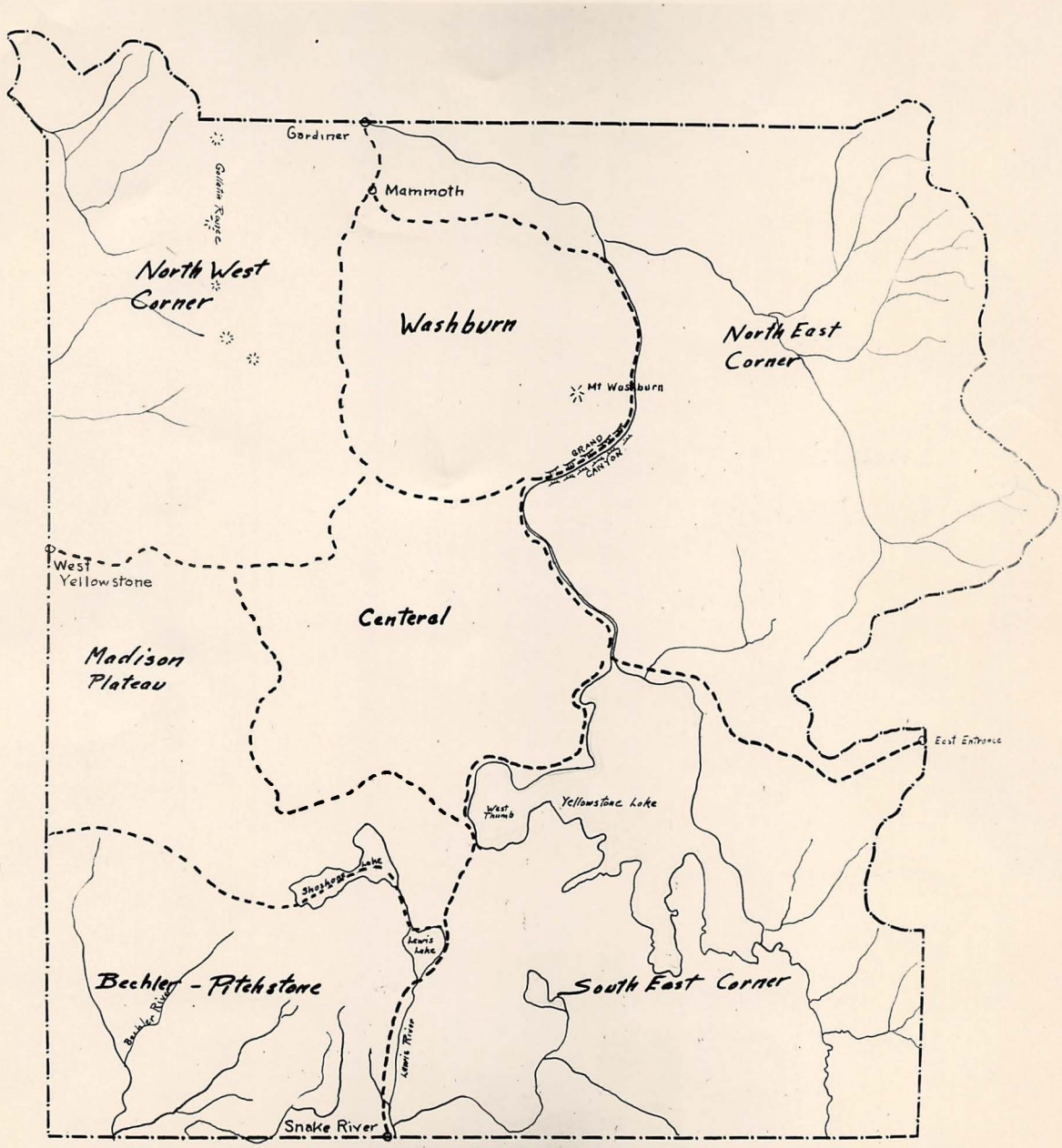

Yellowstone National Park
Insect Survey Units 1934